IDENTIFICATION OF TRAINING NEEDS OF SECONDARY SCIENCE TEACHERS OF TRIBAL SCHOOLS OF MADHYA PRADESH

(PAC APPROVED PROGRAMME NO. 16.04/1999-2000)

DR. P. N. PATHAK
PROGRAMME COORDINATOR

371.967543
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REGIONAL INSTITUTE OF EDUCATION
(NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING)
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FOREWORD

The improvement of quality of Science education is an area of immense and prime importance.Tribal areas of Madhya Pradesh are situated in remote belts of the districts where the Schools are running under the guidance of Tribal Development , Govt.of Madhya Pradesh .Tribal Development has been requesting the RIE to assess the training needs of Science teachers of Tribal Secondary Schools from time to time to design training strategies of teachers to improve the quality of teaching-learning of Science in tribal areas.Keeping in view of the above need , Regional Institute of Education , Bhopal has taken up the programme " Identification of training needs of Science teachers of Tribal Schools of Madhya Pradesh ",

This programme was developed by Dr. P.N.Pathak , Programme Co-ordinator and his resource team in the year 1999-2000 .The efforts made by Dr. P.N.Pathak , Shri.A.C.Pachuary , Dr. S.P.Sharma , Dr(Ms) S.Patnaik , Dr.V.K Kakaria and Shri. J.N.Verma of the Institute to identify the training needs of the teachers and the students are greatly appreciated.

I feel pleasure to express my thanks to Shri. Uday Kumar Verma , I.A.S. Commissioner and Shri.Janardan Singh , Deputy Commissioner, Tribal Development for their interest and managerial support.

I hope that the report of this programme will be useful to Department of Tribal Development in the region in the field of Education .The suggestions for improvement are most welcome.

(**G.K.Lehri**)
Principal

ACKNOWLEDGEMENT

I am happy to extend my warm gratitude to Prof.G.Ravindra (then Principal of this Institute) for inspiring me to undertake the Programme " **Identification of Training needs of Science teachers of tribal Schools of Madhya Pradesh**" Prof G.K.Lehri,the Principal,continued to help me during this programme and I take this opportunity to extend my gratitude to him.Prof. J.K.Mahapatra (then Head DESM) has given me inspiration for this programme and had been helping me for development of tentative and revised tools. I am grateful to him for his help. Prof. S.A.Shafi has been helping me during this programme and I am thankful to him. I cannot forget the kind help given by Dr. J.P.Singh, Head DEE, throughout the programme and I extend my thanks to him.

During the planning and field visits Shri. Udai Kumar Verma Commissioner, Shri.Janardan Singh, Deputy Commissioner, Shri.Purshuttam Tiwari and Shri. B.S.Upadhyaya Assistant Commissioners,Tribal Development,Satpura Bhavan, Bhopal helped me at each level.I am thankful to them, Shri.R.K.Pande, Jt.Director, Tribal Research Institute , Shymala Hills , Bhopal had given me valuable suggestions for field visits of different districts.I express my thanks to him.Shri. A.K.Upadhyaya Asstt.Commissioner ,Tribal Development, Mandla district ,Officials of A.C. Office, Dindori district,Shri.R.S.Singh, A.C. Chhindwara district had helped me by giving me valuable guidance for field trips of the schools situated in remote areas of their districts as well as the vehicles to visits the schools.without their help it was very difficult for our team to locate the schools, I am extremely thankful to them.

I am very happy to extend my sincere thanks to all the Principals and Science teachers of the tribal schools teaching at secondary level for their help and co-operation to our entire satisfaction during the collection of data as regards with our tentative and final tools.

I extend my gratitude to Shri. A.C.Pachauri , Dr(Miss) S.Patnaik and Shri. J.N.Verma to work as resource persons as well as team members accompanying me during field visits and collection of data with tentative and revised tools. I express my thanks to Dr.S.P.Sharma and Dr.V.Kakaria for acting as resource persons .Dr.B.L.Pandit and Dr.A.D.Tiwari ,DEME ,NCERT, New Delhi had devoted one week here in preparation of revised tools .I am sincerely thankful to them.

Dr. P.N.Pathak
Programme Coordinator

CONTENTS

Page No.

1/- Introduction 1 - 9

2/- Dimensions of training needs 10 -14

3/- Analysis of training needs of Tribal Secondary Teachers based on Teachers and Students profile in content area. 15 -35

4/- Analysis of the status based on the questionnaire's of Teachers, Students, Institution, Educational Technology, Curriculum material and Societal support. 36 -61

5/- Conclusion. 62 -64

6/- Appendix 65 - 102

A- Tentative tools.
B- Revised tools.
C- Work-Schedule for the Workshop.
D- List of Resource persons.
E- List of Tribal Schools.

CHAPTER -1

INTRODUCTION

The P.A.C. approved programme No. 16.04 " Identification of training needs of Science teachers of tribal secondary schools of Madhya Pradesh " was assigned to me in the year 1999-2000. To fulfil the objectives of this programme the first meeting of our resource group was held on 21-5-1999. The following points were emerged in this meeting.

1. To contact Tribal Development,Government of M.P., Satpura Bhavan, Bhopal to ascertain their requirements and study the material already published in this regard.
2. To contact Head, DESM , NIE , NCERT, New Delhi to get information whether such types of study has been done by DESM, if it is so then to arrange a copy of the report
3. To contact SCERT Madhya Pradesh , Bhopal to know whether they have done such type of study .
4. To contact teaching faculty of RIE if some one has worked in this field.
5. To identify two tribal areas of Madhya Pradesh.
6. To conduct local workshop for two days to develop tentative tools in this regard.
7. To contact concerned officials for field visits of remote tribal areas.

On 24.5.99 a letter was written to the Head of Department of Education in Science and Mathematics , NCERT , Shri. Aurobindo Marg, New Delhi-16, through Prof . G.Ravindra , then the Principal RIE Bhopal which states that Dr. P.N.Pathak wants to collect necessary material for this

purpose. If any study has been done by DESM regarding it, the same information of the study, may kindly be sent so that it may be helpful for him. I could not get any response of this letter.

I contacted SCERT, M.P. officials but could not get such type of material.

I contacted teaching faculty of RIE Bhopal and found that such type of study has not been done by our faculty.

On 26-5-1999 I went to Tribal Development, Government of M.P. Satpura Bhavan, Bhopal , where I contacted Shri.S.N.Dhruva, Commissioner Tribal Development and apprised him about my programme. He directed me to see Shri. Purushuttam Tiwari, Assistant Commissioner, teachers training. I discussed about my programme with him. He told me that the content upgradation is necessary among tribal school teachers in view of the introduction of new Science curriculum ,some awareness about innovative , recent methods and technique in delivering content, role of multimedia in teaching and practices on prescribed Science experiments are absolutely needed for these teachers. He also wanted,that some instructional material ,which may be useful for these teachers in class room teaching may, also be prepared during this training programme . According to him the tribal population in some of the districts of Madhya Pradesh is spread as follows:

Table 1:Names of tribes in different areas

S.No.	Districts	Name of the tribes found there
1-	Bastar, Sarguja and Raigarh	Dantewada , Muria , Halwa & Gond
2-	Jhabua	Bhil , Bhilala
3-	Mandla	Gond and Bega
4-	Betul and Chhindwara	Gond , Koru and Bharia

He advised me to contact Assistant Commissioners ,Tribal Development at district level while on the field visits of the tribal areas .They will make the proper arrangements to visit the schools .He gave me the book Science Guide for class-10 published by Tribal Development , Madhya Pradesh , Bhopal in the year 1995 as guide line.

On 27-5-1999 I visited Tribal Research Institute , Shymala Hills, Bhopal and contacted Shri. S.K. Pandey , Joint Director of the Institute. He told me that such type of study has not been carried out by the Institute. I should contact Assistant Commissioner, Tribal Development working at district level when I go to districts for field visit to ascertain the training needs. Except Bastar where the office of Assistant commissioner is situated at Jagdalpur , in all other places, they are situated in collectorates. Besides Jagdalpur one will rarely find a tribal school at district head quarter . They are mostly found in the interior belts of the districts.

In the months of June and July 99 we prepared tentative tools for the field study, with our resource group. Prof. J.K.Mahapatra, then Head , DESM , RIE , Bhopal helped me a lot by giving his valuable guidance in this regard.

The meeting of our resource group was held on 17-7-99 in which it was proposed that for assessment of training needs the first week of August 99(2-7) is suitable. For field visits venue should be Mandla, Dindori and Shehdol districts.Four resource persons Shri. A.C.Pachauri , Dr(Miss) S.P.Patnaik, Shri. J.N.Verma and Dr.P.N.Pathak should visit the respective schools of these districts.

On 23-7-99 I went to Tribal Development ,Satpura Bhavan, Bhopal to meet Mr.Janardan Singh, Deputy Commissioner. I gave him copy of our programme of visits of tribal schools of above mentioned districts and sought his help in this regard. He was very happy for such type of study and

assured me full cooperation during the visits. He sent messages to respective officials.

On 2nd August 99 we reached Mandla and met Shri. A.K. Upadhaya , Assistant Commissioner, Tribal Development , Mandla District.We explained him about our programme . He provided us vehicle for visiting the schools.

August 2,3- 1999 , Our team visited the Schools of Mandla district.

August 4,1999 we took Mandla -Dindori route and visited all the schools of Mandla and Dindori districts which were on the route also some those schools which were few kilometres off the route.

August 5,1999 , We met Incharge , Assistant Commissioner, Tribal Development, Dindori district . He provided us Jeep only for a day for visits of a few more schools other than those visited on August 4,1999 .

August 6,1999 , Left Dindori by bus towards Shehdol district to visit the Schools , Due to heavy rain , hostile terrain it could not be possible for us to visit other schools of Dindori and more of Shehdol district

The district wise data collected by us during pilot study is as follows:

Table 2:**No of Schools field tested with tentative tools**

S.No	Name of the district	No of Schools from where data collected.
1/-	Mandla	23
2/-	Dindori	5
3/-	Shehdol	1
	Total	29

Data collected during pilot study were processed and difficulties faced by teachers and students in content area were arranged as per chapters of text books of Science for classes 9th and 10th published by Madhya Pradesh Text Book Corporation, Bhopal. These books are prescribed by Board of Secondary Education, Bhopal for Secondary School Science.

The next meeting of our resource group about this programme was held on 17-9-1999 . It was decided that difficulties identified by teachers and students should be re-looked by the resource team from Hindi Version of their prescribed text books of Science as it is the version being used in these schools, with following objectives:

1. Is textual material given in the text books is appropriate to the level of secondary students , If needed it may be re-written for some selected topics.
2. Is conceptual demand of the topics is compatible with the child's development ,if no, what are the pre-requisite needs before the child could understand these topics, some material is to be developed on this aspect from selected topics. Atleast one topic each in Physics , Chemistry and Biology, should be re-looked on the above lines. These materials along with the tools and identified training needs in content area should be available to workshop mode for revising tools and developing further material.

The following types of people should form the workshop group:

1. Experts in Physics , Chemistry and Biology- 3 , one in each discipline from RIE Bhopal.

2. Teachers teaching science at Secondary School -15 , 5 each in Physics , Chemistry and Biology.

3.Experts in Educational measurements and evaluation to help us to revise tools -2 persons from DEME , NIE ,NCERT , New Delhi.

On 1-10-1999,I proposed that the workshop may be conducted from 22-11-99 to 26-11-99 with the help of the above group , on 27-10-99 , I got the approval from competent authority . On 28-10-99 I went personally to Tribal Development ,Satpura Bhavan ,Bhopal and handed over the letter of the Principal RIE Bhopal to Deputy Commissioner Shri.Janardhan Singh to depute the respective teachers.Two experts from Department of Education in measurement and Evaluation , NIE , NCERT New Delhi were also invited.

It was a surprise for us that on 22nd Nov 1999 even single teacher from tribal department didnot report for the workshop. However Dr.B.L .Pandit and Dr.A.D.Tiwari , DEME ,NIE , NCERT New Delhi reported for the purpose ; With the help of these two experts only, we continued the workshop with the permission of the authorities and developed the revised tools. We informed Deputy Commissioner , Tribal Development, about the non participation of the teachers for the above programme . We also told him that further refinement of the tools may be done in the another workshop provided the authorities of tribal development ensure the participation of the teachers.Later on we took the list of participants from Tribal Department.We sent invitation to each participant on 5-1-2000 The officials of Tribal Development also informed the participants on 19-1-2000 telegraphically to participate in the second phase of the programme from 31st January 2000 to 4th February 2000.

Again on 31st January 2000 participation of Science teachers of tribal secondary schools was nil.I informed Assistant commissioner, teachers training ,Tribal development

(Deputy Commissioner was not on Chair) on telephone about no participation of the teachers and to enquire about it from his Office ; After enquiry from his office he informed me that due to Panchayat Elections the teachers could not participate in this programme .Our Principal Dr. G.K.Lehri , discussed the matter with the Commissioner Tribal Development , Shri Uday Kumar Verma who has also served as Secretary NCERT , New Delhi . He said that we may propose another dates for the workshop and he may be informed personally , so that the participation of tribal Secondary teachers may be ensured.

After continuous contact with the officials of Tribal Development on Telephone , I went there on 9-02-2000 discussed the matter with Shri.Janaradan Singh ,Deputy Commissioner . He fixed the datess 22nd to 26th Feb 2000 to conduct the programme and the participants were informed telegraphically for the third time.on 22-02-2000 we found that only two participants came for the programme , I informed Deputy Commissioner about it and cancelled the workshop with the permission of the Principal after payment of TA and D.A. to two participants and filling the questionnaire of revised tools . Thus we tried three times to hold the programme but due to nonparticipation of teachers finally we had to cancel it.

After cancellation of the workshop, the meeting of our resource group was held in which it was decided to go for field testing with the revised tools.The earliest suitable dates decided for this purpose were 13-16 March 2000 i.e for 4 days since 17th March was holiday for Iduljuha .

Our team members Shri. A.C.Pachauri , Dr(Miss) S.P.Patnaik , Shri .J.N.Verma and Dr. P.N.Pathak decided field visit of Chhindwara district.I went to Tribal Development Satpura Bhavan on 8-04-2000 and contacted Shri N.S.Bhardwaj Assistant Commissioner Tribal Deevelopment.We wrote a letter to Shri.R.S.Singh,Assistant

Commissioner, Tribal Development , Chhindwara District and contacted him also on telephone. On 13-04-2000 we reached Chhindwara in morning .Since Shri.R.S.Singh was out of station we contacted him on telephone. He and his associated helped me by providing vehicle for our field visit of remote areas of chhindwara disrict.From 13 to 16 April we visited 5 blocks of the Chhindwara District i.e. Chhindwara, Junnardeo , Tamaia ,Parasia and Bichhua , coverd 17 schools and contacted 24 teachers.Since it was the time of secondary and higher secondary school examinations , some of the Head --masters and Science teachers, were assigned duties in other non-tribal examination centres hence we could not contact all the Science teachers and Headmasters in their respective schools. Students were busy in studies for examinations. Under these circumstances we could meet very few students However co-operation of the school authorities was quite satisfactory for us.Following table represents number of schools , teachers and students from where the data were collected in the initial and final visits of the tribal areas .

Table No.3 -

No.of School Teachers and Students field tested

S. No.	District	No.of Schools	No.of Teachers	No. of Students		
				Male	Female	Total
1-	Mandla	23	29	35	19	54
2-	Dindori	05	06	10	17	27
3-	Shehdol	01	02	06	05	11
4-	Chhindwara	17	24	05	00	05
5-	Kanker	01	01	00	00	00
6-	Hoshangabad	01	01	00	00	00
	Total	48	63	56	41	97

Later on the data collected through field visits were analysed.We have combined the data of some questionnaires common to both the tools.

Additional questionnaire were analysed for Chhindwara district only which we have given in the report of this programme.

CHAPTER - 2

DIMENSIONS OF TRAINING NEEDS

While identifying the training needs of Science teachers of tribal schools at the secondary stage , we will have to access the following dimensions ,

1/- What difficulties students face in learning Science at this stage ?

2/- What institutional support does a teacher have in teaching Science (in terms of infrastructure like good classrooms , good laboratory , good library and a reasonable support of educational technology)?

3/- What hindrances does a teacher have in having not proper curriculum material ?

4/- Would a good support of educational technology have a teaching learning in Science at this stage ?

5/- What societal support (Parent teacher association,Non Governmental Organisation) will have in improving teaching , learning in Science at this stage ?

DIFFICULTIES EXPERIENCED IN SCIENCE TEACHING

1/- Improper learning of Science textual material(Theory).

2/- Improper conduct of practicals/laboratory work.

3/- Lack of encouragement in conducting Science activities out of school.

LEARNING OF SCIENCE TEXTUAL MATERIALS(THEORY)

Some points to consider:

1/- Presentation / Communication of Science concepts (Language of the material either in text books or the lectures of the teacher).

2/- Flow of concept (in terms of sequence /linkage of concepts).

3/- Background of students or teacher in a certain concept (entry level behaviour).

4/- Logic (understanding) dividing a concept into bits(sub-concepts) to make teaching and learning easy.

5/- To motivate the students to learn a concept easily by the use of audio-visual aids.

6/- Lack of teacher demonstration in a Science class makes Science teaching difficult , boresome and demotivating.

PROPER PRACTICAL / LABORATORY WORK IN A SCIENCE LABORATORY

The ultimate purpose of practical laboratory work is the development of laboratory skills,scientific attitudes and values improper conduct of practical/Laboratory work may be because of :

1/- Lack of laboratory.

2/- Inadequate laboratory facilities.

3/- Inadequate chemicals, glasswares,apparatus , etc .

4/- Non-availability of trained Science teachers to conduct practicals/laboratory work.

5/- Inadequate time available in school time table for practicals/laboratory work.

ROLE OF OUT-OF SCHOOL SCIENCE ACTIVITIES IN PROMOTING SCIENCE TEACHING AT THIS STAGE

Some points to consider

1/- Need for a Science bulletin in the School.

2/- Visits to places of Scientific interests to children to appreciate the diversities in flora and fauna.

3/- Conducting of debates , quizzes on Science topics will encourage Science teaching.

4/- Encouragement to be given for holding Science exhibitions which have direct learning to their environment.

ACTION POINTS

Action points for inclusion in their questionnaires for getting feed backs from students/teachers/educational administrators/responsible persons of the society.

Some questions for consideration

1/-Why students do not understand certain Science concepts ?

2/-What difficulties does a teacher face in making students understand certain Science concepts ?

3/-What difficulties does a teacher face in teaching Science education ?

4/-What difficulties does a student face in doing practicals/ laboratory work ?

5/-What difficulties does a teacher face in doing practicals/ laboratory work ?

6/-What steps does an educational administrator take in making Science teaching meaningful by providing facilities for practical/laboratory work ?

7/-What encouragement is given by educational administrators to conduct out of school Science activities in his institution?

8/-What motivation does a Science teacher provide to students in conducting out of school activities in the institution ?

9/-Which factors keep students away from out of School activities in the institution ?

10/-Questions on practical component to be included in the questionnaire .

11/-Questions on out of School activities to be included in the questionnaire .

12/-Questions to be included , whether the teacher is inculcating in them the idea of protection and preservation of the environment in its totality .

13/-A separate full questionnaire to be developed on the institutional facility in the school specially related to Science teaching.

14/-A separate questionnaire to be developed to assess the relevance /effectiveness of curriculum material.

15/-A separate questionnaire to be developed to assess the availability of educational technology support in the school to supplement and complement Science teaching.

16/-A separate questionnaire to be developed to assess the societal support for teaching and learning Science in the school ,specially Science teaching.

CHAPTER - 3

ANALYSIS OF TRAINING NEEDS OF TEACHERS IN CONTENT AREA

ANALYSIS OF SYLLABUS OF CLASS IX AND X SCIENCE TEST BOOKS OF MADHYA PRADESH TEXT BOOK CORPORATION APPROVED BY BOARD OF SECONDARY EDUCATION M.P.BHOPAL.IDENTIFICATION OF TRAINING NEED IN CONTENT AREA AS PER SURVEY OF TRIBAL SCHOOL SCIENCE TEACHERS AND STUDENTS.

- Content enrichment programmes are needed in those concept areas in which only Science teachers feel difficulty.

- Pedagogical enrichment programmes are needed in which students feel difficulty (not clear to students even after teaching).Teachers need enrichment in pedagogical aspects(as to how to teach these concepts). The assumption behind this is students face difficulty because teachers do not know how to communicate the concepts/contents.

- Content and pedagogical enrichment are needed in those concept areas in which both students and teachers face difficulties.This enrichment can be done after carefully preparing modules and then imparting training to teachers. The assumption behind this is teachers' need, both enrichment in the content areas as well as how to teach it effectively.

Class - IX

Chapter 1- UNIVERSE

Planets , principles of evolution of Universe, consitituents of Universe , Stars , birth and evolution of star, final stage of Star's life, Solar system ,structure of Solar system ,formation of earth, the crust of earth , the core , what makes earth a spherical place.

Topics which students feel difficult:

Linguistic: Birth of stars, principles of birth of Universe, development of stars, last stage of stars.

Topics which teachers feel difficult : Nil

Pedagogical enrichment :

Principles of evolution of Universe, birth of stars, development of stars,last stage of stars.

Chapter -2-**Physical Quantities and their measurement**

Physical quantities , length, mass and time , vector and scalar quantities , units ,vernier callipers, screw guage ,spherometer ,stop clock, physical balance.

Topics which students feel difficult;

Conceptual : Vector and Scalar quantities.

Linguistic : Measurement of physical quantities , international units of measurement ,utility of spherometer.

Acitivities and diagrammatic :	Vernier Callipers handling and measurement ,principles of screwguage.
Descriptive and diagrammatic:	Physical balance.
Numericals:	Regarding vernier callipers screwguage and spherometer's readings.

Topics which teachers feel difficult:

Linguistic:	Physical quantities and their measurement.
Activities &numericals :	Vernier Callipers ,Screwguage and Spherometers, calculations, measurement from readings of the above instruments.

Content and Pedagogical enrichment:

Physical quantities and their measurement (Whole chapter) with emphasis upon practical actitivities and solution of numerical problems based upon it.

Chapter-3- **Force and Motion**

Motion, displacement , velocity , speed (difference between them) equations of motion, force, classification of forces, concept of Intertia , Newton's law of motion , momentum , law of conservation of momentum, wave motion , wave length and frequency.

Topics which students feel difficult

Conceptual: Newtons laws of motion, law of conservation of momentum , force, velocity ,wave length , frequency ,correlation between velocity with frequency and wavelength.

Topics which teachers feel difficult

Concepts: Speed and force.

Pedagogical enrichment: Newton's laws of motion, conservation of momentum ,wave motion and related concepts.

Content and pedagogical enrichment : Motion and force

Chapter-4- Work and Energy

No difficulty either by students or by teachers.

Chapter-5- Heat and temperature

Heat in the form of internal energy , temperature , scales of temperature, F° ,C°, R°, clinical thermometer, expansion of solids , liquids and gases.

Topics which students feel difficult:

Correlation between concepts : Internal energy , heat in the form of internal energy ,heat

and temperature & heat and energy.

Linguistic: Expansion of Water

Diagrammatic and numericals: Fahrenheit Scale.

Topics which teachers feel difficult:

Correlation between concepts: Heat and temperature.

Numericals : Problems related to Heat.

Content and Pedagogical enrichment:

Correlation / distinction between energy , internal energy,heat and temperature, Numerical problems based on heat and temperature.

Chapter -6- Light

Spherical mirrors(concave , convex) , formation of images , refraction of light, total internal reflection, critical angle, refraction, use in daily life, shining of diamond and glass tube in water , mirage , lenses, different types and principal focus of lenses.

Topics which students feel difficult:

Concepts: Focal length, radius of curvature, total internal reflection, mono - chromatic light.

Linguistic ,diagrammatic &principle,teaching aid ; Nature of different lenses, of images , mirage

Activities: Reflection and Refraction, Laws of refraction, Optical instruments

Application of refraction: Why ponds appear to be less deep as compared to actual depth, effect of total refraction in daily life, shinning of diamond.

Topics which teachers feel difficult:

Activity and diagram: Formation of images by lenses.Rules of refraction through rectangular glasses.

Numerical : Regarding image formation

Content and pedagogical enrichment:

Formation of images in plain and Spherical mirrors & lenses. Reflection and Refraction , through practical activities in laboratory and solution of numerical problems based upon it.

Chapter-7- **Magnetism and Electricity**

Magnet , methods of making aritificial magnets, magnetisation by electrical effect, molecular theory of magnetisation, demagnetisation , para, ferro and diamagnetic substances.Coloumb's law of magnetisation, intensity of magnetic field, lines of forces ,electrostatic charge, Coloumb's law in static electricity, electric potential, current electricity, Ohm's law verification , electricity used at home, domestic wiring, fuse , hazards of electricity , electrical power.

Topics which students feel difficult:

Conceptual and linguistic :	Magnetisation ,properties of lines of magnetic force, Colombo's law of magnetisation , magnetic properties of material, alternate current, static electricity.
Diagrammatic and Activity:	Structure of a typical cell, Construction of a artificial magnet & electromagnet , magnetic properties of material , power circuit and house hold wiring , method of fuse safety.

Topics which teachers feel difficult:

Conceptual:	Static electric charge, resistance and alternating current.
Numericals:	Resistance , magnetism and electricity in general.

Pedagogical enrichment:

Teaching concepts in Magnetism & Electricity"in laboratory /demonstration method, .Numerical problems on magnetism and electricity.

Chapter-8- **Matter, Nature and Behaviour**

Elements, compounds and mixture ,structure of matter, molecules and atoms ,cathode rays, anode rays, nucleus ,

Rutherford's experiment, position of electrons ,protons and neutrons in the atom, Bohr Burry Scheme , atomic mass, molecular mass, mole concept.

Topics which students feel difficult:

Conceptual:	Elements ,compounds & Mixtures.
Linguistic:	Understanding of symbols , formulae and molecular mass,discovery of nucleus ,Avagadro's number.
Diagrammatic:	Periodic table, structure of atom , electronic configuration of inert gases. Rutherford experiement , cathode rays and their production.
Numerical:	Mole concept.

Topics which teachers realise difficult:

Numericals:	Mole concept , they also require the easy ways for solutions of numerical problems related to different topics of this chapter.
Pedagogical Enrichment;	-Element, compound, mixture. -Chemical formulae , periodic table. -Structure of atom,Electronic configuration.

Content and Pedagogical Enrichment:

Mole concept and numericals based upon it.

Chapter -9 Chemical Bonding

Elements and symbols , molecular formula, valency and chemical formula ,chemcial equation , electronic configuration , electrovalent linkage, covalent bond.

Topics which students feel difficult:

Conceptual:	Electro and covalency.
Numerical problems:	In chemical equations , valency and chemical formulae.

Topics which teachers realise difficult:

Conceptual and Linguistic:	-Electrons and protons.
Pedagogical enrichment:	-Electro and covalency. -Numerical problems in chemical bonding

Chapter- 10- Physical & Chemical Changes

Physical and chemical changes , different types of chemical reactions:

(i)-isomerisation ,(ii) - combination , (iii)- decomposition iv)-displacement reactions , slow and fast reactions.

Exothermic and endothermic reactions, laws of chemical combination:

(i)- conservation (ii)- definite proportion ,(iii)-multiple propoftion.(iii)-law of reciprocal and (v) Gaylussac's law of gaseous volume.

Topics which students feel difficult:

Conceptual: Physical and chemical changes, law of conservation of mass, exothermic and endothermic reactions.

Difficulty expressed by teachers: Nil.

Pedagogical enrichment:

-Physical and chemical changes.
-Exothermic & endothermic reactions.
-laws of chemical combination.

Chapter-11- Ways of Life

Microhabitates , classification of organisms on the basis of different habitats , interdependence , adaptation, terrestrial adaptation , xeric adaptation, occurrence of adaptation , man manipulates his own habitat, classification of living world , cell structure , difference between plant and animal cell.

Difficulties faced by students:

Occurrence of adaptation , interpendence, cell division, cell structure , xeric adaptation.

Topics which teachers realise difficult: Nil

Pedagogical enrichment:

Adaptation , interdependence, cell division, cell structure, xeric adaptation.

Chapter-12- Human Race

Forms of ancestors, structure of human body, uniqueness of human body, structural limitations of human body.

Topics which students feel difficult:

Uniqueness of human body , structural limitation of human body, human race.

Topics which teachers realise difficult:

Human race.

Content and Pedagogical enrichment;

Human Race(Whole chapter)

Chapter-13- Food and Health

Food and its importance , energy requirement of the body, balanced diet and nature of work ,need and functions of nutrients , components of our food and source ,carbohydrates , fats , proteins , water and roughage, nutritional disorders and food adulteration, adulteration of food material, food yield , food production , soil, sowing , use of fertilizers and manures , control of weeds, crop protection, food management, mode of storage and distribution, food processing , environmental pollution.

Topics which students feel difficult;

Food constituents , main fatty acids in fats related to food, nutritional disorder, table related to food,control of weeds, harmful

effect of over intake food and its calorific values.

Topics which teachers realise difficult: Nil.

Pedagogical enrichment:

-Food constituents, nutritional disorder, harmful effect of over intake of food & its calorific value.

CLASS- X

Chapter - 1- Metals and Non-metals.

Metals and non-metals , their properties and uses, alloys , non-metals and their properties , corrosion of metals.

No difficulty.

Chapter - 2- Atmosphere

Composition of atmosphere ,importance of carbon dioxide, green house effect, effect of man's activities on atmosphere, adverse effect of carbon monoxide , concentration of CO_2 in atmosphere , role of trees , air pollution, fossil fuels and automobiles.

Students's difficulties : Nil.

Topics which teachers realise difficult:

Linguistic; Green house effect , different types of pollutions.

Content enrichment: Green house effect.

Chapter-3- **Water**

Water as a natural resource , origin of life in water, water as a medium for the activities of living beings, water as a solvent , saturated and unsaturated solutions, sea in the form of a resort for marine creatures, salt from sea , uses of water, contamination of water.

No difficulty

Chapter-4- **Carbon**

Allotropes of carbon, occurrence and uses of diamond and graphite , uses of CO_2 and CO , petroleum and its products.

Topics which students feel difficult:

Conceptual: Allotropic forms of carbon.

Linguistic: Uses of carbon monoxide , concentration of carbondioxide in atmosphere.

Diagrammatic: Carbon cycle , nitrogen cycle.

Pedagogical enrichment; -Allotropic forms of carbon , carbon and nitrogen cycles , uses of carbonmonoxide.

Chapter-5- **Solar Energy**

Sun as a source of energy, power of sun , cause of sun's energy, composition of sunlight, abosorption of heat on earth, photosynthesis ,principles of solar heating devices, solar cooker ,solar water heater,solar cells.

Topics which students feel difficult:

Conceptual: Solar energy

Activities & Diagrammatic: Constituents of solar light.

Topics which teachers realise difficult:

Conceptual: Solar energy

Contents & Pedagogical enrichment:

Solar energy (Whole chapter)

Chapter-6-Nuclear Energy

Nuclear reactions, nuclear fission, chain reactions, nuclear reactor, pollution and its bad effects , energy crisis.

Topics which students feel difficult:

Concepts with diagram: Nuclear energy, nuclear disintegration, nuclear reactions.

Linguistic and diagrammatic: Nuclear fission, chain reactions, formation of helium from deuterium

Topics which teachers realise difficult:

Linguistic with diagrammatic : Chain reactions, fusion reactions.

Pedagogical enrichment: Nuclear energy, nuclear disintegration.

Content and Pedagogical enrichment:

Chain reactions ,nuclear reactions.

Chapter- 7- Utilisation of Wind, Water and Bioenergy

Wind and storms, water as a sourceof energy , hydroelectricity ,generation of hydroelectricity, ocean currents, monsoons and water cycle, energy from oceans, biomass , biogas , uses of energy in agriculture , industries and urbanisation, conservation of energy , renewable and non renewable resources, internal combustion engines.

Topics which students feel difficult;

Linguistic: Energy problem, air,water and bio-energies and their uses.

Linguistic and diagrammatic:

Hydroelectricity,internal combustion engine, turbines and generator.

Topics which teachers realise difficult:

Linguistic and diagrammatic:Wind and water as sources of energy.

Pedagogical enrichment:

Hydroelectricity,internal combustion engine, turbines and generator.

Content and Pedagogical enrichment; Wind and water as source of energy.

Chapter- 8- Fuels.

Classification of fuels, calorific value , ignition temperature ,combustion of fuels, fossil fuels, ideal fuels.

Topics which students feel difficult:

Linguistic: Fossil fuels.

Activity: Uses of fuel.

Pedagogical enrichment: Fossil fuels, uses of fuel.

Chapter- 9- Space exploration

Important events related to space exploration, space science in India, main efforts of Indian scientists , applications of space science.

Topics which students feel difficult;

Linguistic Universe - discovery and history. Information collected by Bhaskar from space, Indian remote sensing satellite IRS-I B.

Topics which teachers feel difficult:

Linguistic and diagrammatic- Space exploration.

Content and Pedagogical enrichment:

Space exploration(Whole chapter)

Chapter -10- Nutrition and Respiration

Types of nutrition , digestion in man, respiration, repiratory organs in different animals, economic importance of fermentation.

Topics which students feel difficult:

Reactions in digestion, nutrition respiration.

Topics which teachers realise difficult: Nil

Pedagogical enrichment:

Reactions in digestion, nutrition and respiration.

Chapter - 11- Photosynthesis

Essential raw material for photosynthesis ,test for starch formation in leaves, test whether light and carbon dioxide is essential for photosynthesis , evolution of oxygen during photosynthesis ,photosynthesis and respiration.

Topics which students feel difficult:

Test of starch formation in leave.

Topics which teachers realise difficult : Nil

Chapter- 12- **Transport of materials and blood circulation**

Transportation in plants and animals and process, blood , the circulatory system in human heart, lymph.

Topics which students feel difficult:

Blood circulation in man ,transportation and circulation of materials.

Topics which teachers realise difficult: Nil

Pedagogical enrichment: Blood circulation in man ,transportation & circulation of materials.

Chapter-13- **Excretion**

Excretion in plants, animals and man, process of urine formation.

Topics which students feel difficult; Excretion.

Topics which teachers feel difficult : Excretion.

Content & Pedagogical enrichment: Excretion(whole chapter)

Chapter -14- **Reproduction and Growth**.

Reproduction - Asexual and sexual, growth and its various stages.

Topics which students feel difficult : Nil.

Topics which teachers realise difficult :

Reproduction and growth

Content and Pedagogical enrichment:

- Reproduction & growth (whole chapter)

Chapter -15- Control and Co-ordination

Chemical co-ordination in plants and animals , important hormones of human body, nervous system , human brain.

Topics which students feel difficult:

Control & Co-ordination: Nervous system, human brain , chemical co-ordination in plants.

Topics which teachers realise difficult:

Control and co-ordination.

Content & Pedagogical enrichment:

Control & co-ordination (Whole chapter)

Chapter -16- Bio-Sphere

Bio-sphere ,structure , functions and sources of energy , food chain and food web., flow of energy , cycle of material and role of energy (water , carbon ,nitrogen and oxygen –

cycles).Ecological balance(Abiotic, biotic and socio-cultural environment).

Topics which students feel difficult: Bio-sphere.

Topics which teachers realise difficult : Nil.

Pedagogical enrichment:

- Bio-sphere (Whole chapter)

Chapter-17-**Role of man and Environment**

Need for proper replenishment and management of living resources , replenishment of ground water, soil and forest , effects of our exploitation and industrialisation, air and water, pollution, depletion of ozone layer, bio-concentration of pesticides, effects of unplanned technological growth ,environmental planning for better future, recycling of waste materials for ecological balance.

Topics which students feel difficult

Role of man and environment
bioconcentration of
pesticides,replenishment of soil.

Topics which teachers realise difficult: Nil

Pedagogical enrichment :

Role of man and environment (whole chapter)

Chapter-18- **Science,Technology and Society**

Technology changes our life , technology and Science are interdependent ,development of technology as per the need

of society ,history of technology ,contribution of technology in harnessing the energy ,new technology new needs.

Topics which students feel difficult:

Linguistic: Science ,technology and society.

Pedagogical enrichment : Science technology and society (whole chapter)

CHAPTER - 4

ANALYSIS OF STATUS

Analysis of Status for Identification of Training Needs of Science Teachers of Tribal Secondary Schools of Madhya Pradesh based on tentative and revised tools

Teacher's Questionnaire

1-Number of Districts from where data was collected: 6

2-Number of Blocks : 20

3-Number of Schools : 48

Names of districts, blocks and schools is given in appendix No. E

4-Number of teachers from whom data were collected: 63

5-Location of schools : It is represented in Table 1 as given below

Table No.1
Location of schools

Location of the schools	Urban	Semi Urban	Rural
Number	1	2	45

The perusal of the above table shows that most of the tribal schools are situated in rural areas.

6-**Management of the schools:** All the schools visited by us are running under tribal development , Govt.of MadhyaPradesh .We were told by officials that no schools in the visited areas are running under private sector/Non-Governmental Organisation (NGO).

7-Age:_The Table No.2 , given below represents , the distribution of teachers under different age groups:

Table No.2

Distribution of teachers according to age groups

Age group	21-25	26-30	31-35	36-40	41-45	46-50	51-55
Number	4	17	14	17	5	5	1

The perusal of the above table shows that teachers in age group 21-25 , 41-45 ,46-50 and 51-50 are less in numbers.

8-**Qualifications;**

Table No.3 represents the number of teachers with qualification , qualified and not qualified teachers, trained and untrained teachers.

Table No-3

A -Variation of teachers with different qualifications
Total No of Teachers - 63

Qual.	B.Sc.	B.Sc B.Ed	B.Sc D.C.A	B.Sc M.A.	M.A.	M.Sc	M.Sc B.Ed	M.A. B.Sc. B.Ed	M.Sc M.Ed	M.A B.T.I.	Blank
No.of Teachers	8	12	1	1	1	8	26	1	1	2	2

B-Distinction of teachers as Qualified ,Unqualified ,Trained and Untrained teachers.

Teachers	Minimum Degree	No.of Teachers	Percentage
Qualified	B.Sc.	58	92
Unqualified	Non-B.Sc.	5	8
Trained	B.Ed or M.Ed	40	63
Untrained	Non-B.Ed	18	23

The above table indicates that 58 teachers ie.92% of total numbers of teachers are qualified to teach science at secondary level and 40 teachers i.e.63 % of total number of teachers are trained and qualified teachers where as 18 teachers or 29% of total numbers are untrained but qualified to teach Science.

9-Teaching experiences of secondary school teachers-

It is represented in table number 4 given below

Table No : 4

Teaching Experiences of Secondary School Teachers

Years of Service	1-5	6-10	11-15	16-20	21-25	Blank
Numbers	25	8	22	6	1	1

The perusal of above table shows that maximum number of teachers have got 1 to 5 years of teaching experience. .They are generally servicing as Shiksha Karmis. Teachers having teaching experience of 11 to 15 years are also in good numbers.

Training Profile

1/-Inservice training Programmes

The following table represents the number of teachers undergone in any training programme, out of them the number of teachers oriented in training programmes under the scheme of improvement of Science education in the schools(SISES), training programme specially designed for teaching Science in tribal schools.

Table No-5

List of the numbers of teachers undergone in training programme with percentage .

Total number of teachers involved is : 63

S.No.	Training programme	Number of teachers involved	Percentage
1/-	Any type of Programme	7	11
2/-	SISES	1	1.5
3/-	Training programme specially designed for teaching science in tribal schools	Nil	0

The above table indicates that 11 percent of total numbers of teachers have attended some training prgrammes.Only one teaches has been oriented in training programme under scheme of improvement of Science education in schools.No tribals teacher has undergone any training programme specially designed for teaching Science in tribal schools.

2/-**Use of kit for teaching Science** - Table below indicates the percentage of teachers using Science kit.

Table No- 6

Use of kit for teaching Science

Total no of teachers	No. of teachers using kit	Percentage of teachers using kit	No. of teaches who say that help teaching in a better way
63	22	35	1

3/-**Development of improvised experiments**: No teacher has developed any improvised experiment for teaching Science

Subject teaching Profile

1/-Strategy adopted for teaching Science

Teachers have written their area of specialisation at graduate level.For teaching topics other than their specialised areas , use of reading text books, related material ,discussion with colleagues ,watching /listening educational television/radios and reading scientific magazines/newspapers is shown in table no 7 given below;

Table No-7

Use of related material for teaching Science

S.No.	Strategy adopted	No. of teachers involved	No. of teachers using material	% of teachers using material
1/-	Reading text books	63	37	59
2/-	Reading related material	63	21	33
3/-	Discuss with colleagues	63	22	35
4/-	Watching/listening educational television/radio	26	4	15
5/-	Reading scientific magazines/news papers	26	6	23

Item number 1,2 and 3 are based on tentative and revised tools where as 4 and 5 are on the basis of revised tools only.The above table shows that 59 percent teachers are reading text books, 33 percent are reading related material, 35 percent discuss with their colleagues ,15 watch /listen educational television/radio and 23 percent read scientific magazine/newspapers.

2/-Common difficulties experienced by teachers while teaching Science:

The common difficulties of teachers while teaching Science to tribal students are presentation /communication of concepts , sequences of concepts ,lack of proper background to learn concept and understanding of the logic of concepts, lack of audio visual aids to supplement /complement Science teaching and lack of teacher demonstration to motivate students to learn Science.These difficulties are analysed in the table no.8 which is given below;

Table No-8

Types of difficulties experienced by teachers

S.No.	Type of difficulty experienced by teachers	No.of teachers involved	No. of teachers experienced the difficulty	% of teachers experiencing the difficulty
1/-	Presentation/Communication of concepts	26	9	35
2/-	Sequence of concepts	26	8	30
3/-	Lack of proper background to learn concepts.	26	8	30
4/-	Lack of understanding of the logic of concepts.	26	6	23
5/-	Lack of audio visual aids to supplement/comple - ment Science teaching	26	14	54
6/-	Lack of teacher demonstration to motivate students to learn Science.	26	6	23

3/-Difficult topics realised by teachers and students

Teachers were requested to write subjects/topics which they realise difficult while teaching Science as in the given table:

Theory Subject/ Topics	Types of difficulties

The teachers as well as the students (separate profile) have written the difficult topics with types of difficulties .They are analysed chapterwise according to the text books of Science for class 9th and 10th published by Madhya Pradesh Text Book Corporation. I have arranged them in the form of separate chapter of this report i.e. " Analysis of training needs of Tribal teachers and students based on subject teaching profile and students questionnaire with respect to content areas". In that chapter I have arranged them as follows : Class , Chapter number, Name of the Chapter , prescribed syllabus for that chapter, topics which students feel difficult, topics which teaches realise difficult and programme needs for enrichment of content, pedagogy as well as content and pedagogy requirement for teachers.Since it is the most important factor for training needs of teachers hence discussion in the separate chapter is required.

5/-Laboratory facilities : Teachers were asked whether their schools have laboratory for conducting the practicals at secondary stage. If the laboratory is there whether it is well quipped and if not well quipped what are the deficiencies in it.The first two questions were replied by teachers while only one teacher has written about the deficiencies in laboratory.They are represented in the table No.9

Table No-9
Laboratory facilities

S No.	Laboratory facility	No. of teachers involved	No.of teachers who say YES	% of teachers
1/-	Whether they have laboratory	26	22	85
2/-	Whether laboratory is well equipped	26	7	27
3/-	Deficiencies in laboratory	26	1	4

Perusal of the above table shows that 85 percent of teachers have laboratory facility while 27percent teachers state that their lab is well equipped.One teacher has written that there are deficiencies of equipments , chemicals , specimens,models, charts and proper space in the laboratory.

5/-Difficulties faced by students while doing practical work in laboratory as expressed by teachers:

There are some common difficulties e.g. Lack of laboratory, lack of teacher supervision and guidance , hesitation of students in doing practical work, fear of accidents/mishaps which students face while doing the practical work. Teachers were asked to give their view points in these regards. They are analysed in table No. 10 as given below:

Table No-10

Analysis of difficulties faced by students in doing laboratory work as expressed by teachers

No. of Teacher involved :- 26

S.No.	Type of difficulties	No. of teachers expressed the difficulties	Percentage of teachers expressed the difficulties
1/-	Lack of laboratory	14	54
2/-	Lack of facilities	17	65
3/-	Lack of teacher supervision and guidance	10	38
4/-	Lack of supporting staff	6	23
5/-	Hesitation of students in doing the practical work	5	19
6/-	Fear of accidents/mishaps	1	4
7/-	Any other	0	0

It is obvious from the above table that these types of difficulties are also experienced by students in more or less extent as expressed by teachers.

7/-Facilities provided by Principal/Educational Administrator for laboratory work

This questionnaire was answered by 26 teachers in the revised tool questionnaire in which 15 teachers say that

this facility is provided to them by their higher authorities which is represented in the table No.11

Table No-11

Facilities provided by Higher Authorities for Practical/laboratory work.

No. of teachers involved	No. of teachers who say YES	% of teachers
26	15	58

The perusal of the above table shows that 58 percent teachers are getting help from their principals or administrative officers.

7/-Statement of out of school. Science activities conducted in schools.

This questionnaire includes the out of school activities being conducted in schools such as display of Science bulletin board, organising Science lectures and debates /quiz ,screening of Science telecasts/broadcasts .Organisation of science fairs , visits to places of scientific interests (museum/zoo/botanical garden/factories/laboratories), provision of Science magazines /books/news papers.Following table No.12 represents the different types of activities carried out in schools

Table No.12

Analysis of out of School Science activities .

No. of Teachers interviewed : 26

S.No.	Out of School Science activities	No. of teachers doing the activities	Percentage of teachers involved in these activities
1/-	Out of school activities being conducted in schools	12	46
2/-	Types of school activities		
	a-Display of Science bulletin board	2	8
	b-Organising Science lectures	6	23
	c-Organising Science debates/Quiz	12	46
	d-Screening of Science telecasts/ broadcasts	0	0
	e-Organising Science fairs	11	42
	f-Visits to places of Scientific interests (museum/zoo/botanical garden/factories/laboratories).	0	0
	g-Provision of Science magazines/books/news papers	2	8
	h-Motivation of students by teachers in out of school activities.	19	73

The perusal of above table shows that 46 percent teachers are involved in out of school activities,8% teachers state that there is Science bulletin board in their schools. 23 percent are organising Science lectures for their students. There is good percentage of 46 teachers organising Science debates/quiz .There is no screening facility available to schools . 42 percent teachers organise science fair ,Teachers do not take their students for visits to places of scientific interests(museum/zoo/botanical garden/factories/laboratories) The tribal areas are full of natural wealth (forests, animals , mines, variety of land, hills) .Students may be made familiar with their surrounding from scientific view points.There is provision of Science magazine/books/new papers in the schools of only 8 percent teachers.

The difficulties being faced by rest conducting these activities are due to shortage of funds as well as motivation from their higher authorities or experienced people in the field.73 percent of teachers motivate their students in doing out of the Science,school activities ,through arranging lectures, using question answer techniques for enrichment of knowledge of students , giving new scientific informations other than books, ,suggest precautions for keeping themselves healthy ,beware about environment, reading newspapers , guide for preparation of models and charts, arrange Science fairs , make familiar about the use of Science in their practical life.

27 percent of the total number of teachers have written that they do not motivate their students for doing out of school Science activities but they have not listed any activity difficult to initiate with reason.

8-`Active participation of the students in the class

The following table represents the active participation of tribal students in the class room while teacher is teaching

Table No-13

Participation of students in the Class room

Number of teachers involved	No. of teachers saying Yes	%	No. of teachers saying No	%
63	27	43	36	57

43 percent teachers say that their students participate in the class.They use different strategies to promote tribal students' participation which are as follows : using lecture method, use of black board in effective way , giving books to students for their study in homes, using demonstration method , through explanation ,giving notes for important points/concepts/topics ,checking their class notes regularly , solving numericals , giving monthly tests to students.

57 percent teachers state that their students do not actively participate in the class room.The reasons behinds it are: Their students are coming to schools after walking from long distance ranging from 10 km to 20 km for their studies, since their homes are in remote villages of tribal areas.They do not have proper atmosphere for their studies at their homes since their parents are illiterate .They do not have televisions or radio in their homes to enrich their scientific knowledge.Tribal students have improper social background and hence are lacking fundamental scientific knowledge

9/-Types of difficulties faced by teachers while teaching to tribal students

Teachers face different types of difficulties while teaching the tribal students.Such types of difficulties are language of communication, unsuitable curriculum material , lack of laboratory , lack of audio-visual aids, being first generation learners and poverty of students to purchase the necessary learning material.These points are analysed in the form of table No.13 as given below:

Table No-14

Types of difficulties faced by teachers

Number of teachers involved are **26**

S.No.	Types of difficulty	Difficulty faced by No. of teachers	% of teachers
1/-	Language of communication	6	23
2/-	Unsuitable curriculum material	10	38
3/-	Lack of laboratory	11	42
4/-	Lack of audio-visual aids	15	58
5/-	Being first generation learners	15	58
6/-	Poverty of students to purchase necessary learning material	22	85

Analysis of the above table is self explanatory besides the above points in the table some common difficulties faced by teachers , as per pilot study , are as follows;

Students do not understand the problems which are given to them., their previous background is below standard. They take more time to understand the topics.Science text books are in Hindi literature but their language is specific local.Tribal students do not achieve adequate learning at their primary stage.Illetrate parents do not concentrate on the study of their children .Students do not revise their lessons due to domestic problems hence they forget their lessons taught in the classes and at last they become weak in their studies, some of the teachers complain about inadequate buildings and practical facilities in Science laboratory.

Analysis of Student Profile

We have analysed the students questionnaire under pilot study and written the different topics which students feel difficult while studying Science.Piolet study was done in the month of August 99 , We selected the students of class 10th to write the difficult topics which they feel difficult in class 9th. For difficult topics of class10th we selected some students of class 11th from each school ,we had selected these tribal students on the basis of random sampling.We have analysed the difficult topics and written them in a separate chapter No.3 of this report.We field tested Chhindwara district with revised tools in the month of March 2000 ,.We could not find adequate no, of students due their annual examinations hence revisited students questionnaire could not be analysed

Analysis of Institutional Questionnaire

The Institutional Questionnaire was added in the revised tools .We had visited 17 schools of Chhindwara district to collect the data. Only two participants one each from Hoshanagabad and Kanaker district had come to attend workshop in last week of February 2000 . The workshop was cancelled since

number of participants required was 15.However the questionnaire was filled by them, hence wc have data of 19 schools .The district block and name of the schools has been shown in appendix-E.The analysis of data is represented as follows:

1- Total no .of years of establishment of Schools

The following table represents the status of schools through groupwise ages.

Table No-15

Groupwise ages of the Schools

Group of Years	1-5	6-10	11-15	16-20	21-25	26-30	Beyond 31	Blank
Number of Schools	4	0	4	0	3	4	40	4

The perusal of the above table shows that the tribal schools have come to their existence for the last 30 years. In two ages groups i.e 6 to 10 and 16-20 the number of schools opened is nil. Numbers of tribal school are continuously increasing in the state through the effort of Tribal Development, Govt.of Madhya Pradesh.

2/-Educatioal qualifications of the Principals

Table No. 16 shows analysis of educational qualifications of the Principals.

Table No-16

Educational qualifications of the Principals

Qualification	Ph.D	M.A.	M.A., B.Ed	M.Sc.	M.Sc., B.Ed	Blank	Total
Numbers	1	5	4	3	3	13	19

The perusal of the table is self explanatory .In some of the schools the Principals were out of station due to their duties in annual examinations in other schools etc., hence we could not collect the data of all the principals about their experience hence we are not analysing them.

3/-Participation in service programmes of teachers teaching at secondary stage:

The following table No.17 shows the total numbers of secondary Science teachers serving in different schools of Chhindwara district visited by us and number of teachers who have attended workshop /seminars in Science Education.

Table No-17

Percentage of teachers who have attended the workshop/seminars in Science Education.

Total No. of Teachers	Number of teachers attendedworkshop/seminar	Percentage of teacher attended workshop/seminar
80	8	10

The perusal of above table shows that only 10 percent of the total number of teachers have attended workshops/seminars .This figure is in good agreement of data collected by us as represented in table No.5 which is 11 percent.

4/-Analysis of facilities in laboratory and laboratory assistant

Analysis of the facilities in laboratory whether the schools have enough chemicals ,glassware and apparatus for Science teaching at secondary stage and laboratory or any other personal assistants , has been represented in the following table.

Table No- 18
Facilities in laboratories

S.No.	Facility	Total No. of Schools	No. of Schools having facilities	Percentage of Schools having facilities
1/-	Enough chemicals glasswares and apparatus	16	7	44
2/-	Laboratory or any other personal assistant	16	7	44

The above table indicates that 44 percent of total number of schools have enough facilities of chemicals,glasswares and apparatus in the Science laboratories in the schools. Laboratories or personal assistants are also there in 44 percent schools.

Analysis of Educational technology questionnaire

1/-Facilities of Radio/Television in the schools :

20 teachers have filled this proforma, according to analysis of data no school has got either television or radio hence there is no question of watching or listening of programmes of scientific interests.

2/-Analysis of schools having Science charts:

A question was asked whether the schools have enough of Science charts to depict various flora, fauna, industrial processes, life histories of scientists ,anatomical representation of human body,balanced diet ,alternative source of energy, conservation and protection of natural resources etc. The following table shows the description of them

Table No-19

Facility of charts available in the schools

Total No. of schools	No. of Schools having charts	Percentage of schools having this facility
19	4	21

The perusal of above table indicates that 21percent of total number of schools have charts of various kinds of scientific interests.

3/-Analysis of facility-Scientific models

The following table shows description of some scientific models depicting structure of atoms, molecular structures of different chemicals , industrial processes etc., available in the schools.

Table No-20

Facility of scientific models available in the schools

Total No. of Schools	No. of Schools having models	Percentage of schools having Models
20	2	10

The above table indicates that 10 percent of total no. of schools have the facility of models

4/-Analysis of facility of bulletin board

The table No. 21 represents the facility of bulletin board for depicting Science news and scientific inventions etc.,

Table No.21

Facility of bulletin board

Total No. of schools	No. of schools having bulletin	Percentage of Schools having bulletin boards
20	2	10

The perusal of above table shows that 10 percent of total number of schools provide bulletin board for the purpose.They have not written the place provided in the building and the things depicted on the bulletin board.

Analysis of Curriculum Material Questionnaire

1/- Use of Science textbooks :

Almost all the teaches use Science text books , Vigyan class 9 th and Vigyan class 10th written in Hindi language ,

published by Madhya Pradesh Text Books Corporation , Bhopal , besides this book few teachers also use Yugbodh , Shivlal Agarwal , written in Hindi language.

2/- Language of the text books:

A question was asked from teachers whether the language of the text books is within the comprehension of the teachers and students. The analysis of this question is given in the table No.22

Table No.22 - Language of the text book

S.No.	Whether it is within the comprehension	Total no. of teachers involved	Yes	Percentage
1/-	Teachers	20	15	75
2/-	Students	20	15	75

The perusal of the above table indicates that 75 percent of teachers say that the language of the text books is within the comprehension of teachers and students.

3/-Types of difficulties in the language of the text books

Teachers were asked if the language of the text books is not within their comprehension they should write the difficulties found out in the language of the text books.Analysis of this question is given in the table No.23 which is as follows.

Table No.23 : **Difficulties in the language of the text books No. of teachers involved - 2**

Sr. No.	Types of difficulty	No. of Teachers agreeing with these part	% of teachers agreed
1/-	Difficult vocabulary	12	60
2/-	Language is not understood by the tribal students .	12	60
3/-	The flow of language is uneven	13	65

Perusal of the above table indicates that 60 percent teachers say that in the language of the text books there is difficult vocabulary and it is not understood by tribal students while 65 percent teachers say that flow of language in text book is uneven..There is a analomoly in the data of table No. 21 and Table No.22 which indicates that teachers could not follow the points properly.

4/-Whether the text books have sufficient diagrams and charts to make Science concept easy

The analysis of the above question is shown in the table no.23 given below;

Total No. of teachers	Agreement with Questions.	Left blank	Percentage of agreed teachers
20	8	4	40

The above table indicates that 40 percent teachers say that text books have sufficient diagrams and charts , rest of the teachers have not written any defect in diagrams and charts of the books.

5/-Teacher's guide and supplementary reading material

Following table represents the answers of question whether they are provided with teacher guide to supplement and implement their knowledge in Science so that they are very effective Science teachers inteaching Science and supplementary reading material about Science to make Science teaching enjoyable and interesting to learn.

S.No.	Material	No.of Teachers involved	No.of teachers provided with material	% of teachers get the materials
1/-	Teacher's guide	20	3	15
2/-	Supplementary reading material	20	3	15

The perusal of the table no. 24 shows that 15 percent of total no. of teachers are provided with teacher's guide and supplementary reading material but no body has mentioned the additional information provided in teacher guide and about any topic covered in supplementary reading material

Societal Support

The questionnaire of societal support has been left blank in all the schools visited by us which indicates that there is no societal support at all to any tribal school.We are told that all the schools , in the districts visited by us , are running through Tribal Development , Govt. of Madhya Pradesh.There is not Non-Governmental Organisation (NGO's) extending support to any tribal school.

There is no parent-teachers association in the schools.Most of the tribal student's parent are extremely poor and illiterate hence they may not be knowing about such type of associations in the schools.Society in general around the schools does not help the schools for improvement of Science technology at secondary school level.

CHAPTER - 5

Conclusion

For preparation of revised tools and development of instructional material we had proposed the workshop of secondary Science teachers of tribal schools of M.P. 3 times from 22nd Nov 1999 to 26th Nov 1999. , Jan 31st to 4th Feb 2000 and Feb 22nd to 26th Feb 2000, but are unhappy to state that due to non participation of teachers from tribal schools we had to cancel it finally . Our resource group had prepared the tentative tools. After field visits we could get more information and could prepare the revised tools with the help of the experts of Department of Education in measurement and evaluation , NCERT, New Delhi.

The present report " Identification of training needs of secondary Science teachers of tribal schools of M.P." is an outcome of the analysis of data available from three schools, one each from Shehdol , Kanker and Hoshangabad districts and 45 schools of Mandla , Dindori and Chhindwara districts.

The Most of the tribal schools are situated in the remote areas of Madhya Pradesh . They are controlled by the Tribal Development, Govt.of M.P. Most of the tribal teachers are in the age group of 26 to 40 years and are qualified to teach Science as per norms.Accept Shiskha Karmis rest of the teachers have got good experience of teaching. Eleven percent of the total number of teachers have undergone some types of tranings yet they require refresher course to uptodate the knowledge of Science teaching . Science kit is essential in all the schools to teach Science through demonstration method. Teachers should be trained to develop improvised experiments . Laboratories of the schools should have at least minimum required facilities, for teaching tribal students and

specially designed training programmes for teachers may also be arranged at district level keeping in view of local surroundings , needs and languages. We have sorted out the difficult topics for each chapters as per text books of Science, class 9th and 10th published by Madhya Pradesh Text Book Corporation ,on which the orientation of Science teachers is required to reduce/minimise their difficulties .

Out of school Science activities (display of Science bulletin board, organising Science lectures and debates/quiz, screening of Science telecasts/broadcasts, organising Science fairs, visits to places of Scientific interests., museum ,zoo , botanical garden, factories, laboratories, visits to surrounding areas e.g. land, hills, animals ,agricultural field related to their scientific studies and provision for Science magazines/books/news papers) are also required for students to enrich their scientific knowledge so that the students may enjoy while studying Science at secondary level.

In present days , we emphasise use of computers, satellites and internet.Use of computers is common in schools but we have found that there is neither television nor even radio in any school of Chhindwara district where we have applied the revised tools. Each school should be provided at least a radio for enrichment of scientific knowledge which is being broadcasted from time to time.

Only few schools have got enough Science charts and models for demonstration purpose which should be supplied in sufficient numbers to bring the positive change in Science teaching.

The tribal students and teachers use Science text books , Vigyan for class 9th and 10th written in Hindi published by Madhya Pradesh Text book Corporation ,Bhopal . Most of the teachers are

of the opinion that the language of the the text books is within the comprehension of students yet some of them feel that the text books have difficult vocabulary and their language is not understood by tribal students.Teachers suggest that there should be more relevant diagrams in the text books.Teachers also demands teacher's guide and supplementary reading material to enrich their scientific knowledge . The libraries of the schools should be strengthened with such type of books so that it would be easy for the teachers to often refer them.

Tribal schools are situated in remote areas of the state and they are running under Tribal Development,Government of Madhya Pradesh.The local population surrounding these schools is poors,There is no societal support to any school which we have visited,There is no parent teacher association in any schools to look the welfare of students. Tribal population is not interested in academic activities of schools,There is no support of any Non-Governmental Organisation to these schools which should be promoted.

We have met students of tribal schools , they co-operated with us to our entire satisfaction .They wrote their difficulties in content areas. Some of the students have told us that their teachers do not take classes regularly .It is the pious duty of teachers to take classes regularly and solve the difficulties of the students for enrichment of their knowledge.

APPENDIX - A

Regional Institute of Education

PAC approved programme No. 16.04

Identification of Training needs of Science teachers of Tribal Schools of Madhya Pradesh

Tentative tools.

Personal Profile

1/- District..................................

2/- Block......................................

3/- Name of the school..

4/- Location of the school : Urban/SemiUrban/Rural

5/- Management of the school : Govt./SemiGovt/Private

6/- Name of the teacher...

7/- Age.......................................

8/- Qualification...

9/- Years of service as a Secondary school teacher........... ....

10/- Years of service as a Tribal school teacher................

11/- Distance of the school from your residence...................

Training Profile

1/- List the training programmes you have undergone for Science teaching during the last five years

(a)..

....

(b)..

....

(c)..

....

2/- Have you undergone any training programme specially designed for teaching Science in tribal schools ?

Yes/No

3/- If yes , Are you utilising the training undertaken by you in your class room teaching ?

Yes/No

4/- If Yes, How ? Give in brief some specific examples in 4-5 lines.

....

....

....

....

5/- if No, list the reasons for not utilising the training .

(a)..

(b)..

(c)..

6/- Have you undergone any training programme under the scheme of improvement of Science education in schools (SISES) programme ?

Yes/No

7/- If yes , give details :-

(a)-Place attended...

(b)-Duration..

(c)-Type : Primary /Elementary/Secondary/Higher Secondary..
...

....

8/- If No, Why ? List the reason for not attending the programme...

....

9/- Do you have any kit for teaching science ? Yes/No

10/- Have you developed any innovative experiment ? Yes/No

11/- If yes. List below the experiments you have designed-

(a)-...

(b)-..

(c)-..

(d)-..

12/- Have obtained any financial support to develop the experiments ? Yes/No

13/- If yes ,give the name of Organisation/person giving you the support ....

....

Subject Teaching Profile

1/- Write below your area of specialisation at graduation level

……………………………………………………………………

2/- For teaching topics other than your specialised topics , what is the strategy you adopt ? Please put tick mark (√)

(a) Reading text books from that area.
(b) Using related reference material.
(c) Discussion with colleagues
(d) Any other.

3/- Below are given some common difficulties experienced by teachers while teaching Science

(a)-Conceptual.
(b)-Comprehensive.
(c)-Diagrammatic
(d)-Related to numerical problems
(e)-Related to communication.

Write the difficult topics you realise while teaching in the given table

A- Theory Subject/Topics	Difficulties

(B)- Practical Subject/Topics Difficulties

4/- Do your tribal students actively participate in the class when you teach ?

Yes/No

5/- If yes , How do students actively participate ? Indicate the strategies you use to promote Tribal students participation.

6/- What difficulties do you face while teaching the Tribal students ?

STUDENTS PROFILE

1/- District ....

2/- Block..

3/- Name of the school....................................

4/- Location of the school : Urban/Semi Urban/ Rural

5/- Management of the school : Govt/Semi Govt./ Pvt.

6/- Name of the student....................................

7/- Class in which you are studying.........................

8/- Topics which you find difficult in studying Science.

Topics	Reason	Expectations from your teacher to over come difficulties

SUPERVISOR / NGO PROFILE

1/- District………………………………………………

2/- Block…………………………………………………

3/- Name of the Supervisor/ NGO…………………………

4/- Post onwhich you are working…………………………

5/- Qualification……………………………………………

6/- Experience in the field in years ……………………

7/- From your experience, what are the topics in Science which you feel difficult for Science Teachers to teach Science at secondary level

8/- What do you propose to remove these difficulties of the teachers ?

APPENDIX - B

REVISED TOOLS

REGIONAL INSTITUTE OF EDUCATION

Identification of Training needs of Science Teachers of Tribal Secondary Schools of Madhya Pradesh

Teacher's Questionnaire

1/- District..

2/- Block ....

3/- Name of the school ....

4/- Location of the school | Urban /Semi Urban/Rural |

5/- Management of the school | Govt./Semi.Govt./Private |

6/- Name of the Teacher..............................

7/- Age...

8/- Qualification....................................

9/- Years of service as Secondary school teacher.................................

10/- Years of service as a tribal school teacher............................

11/- Distance of school from your residence...................................

12/- Mode of transport used in reaching school..............................

Training Profile

1/- List the training programmes you have undergone for Science teaching so far:

(a)- ....

....

(b)- ....

....

(c)- ....

....

2/- Have you undergone any training programme specially designed for teaching Science in tribal schools ? (tick the relevant) Yes / No

3/- If yes,
(a)- Give the details of the training programme (Title, Year,Duration)

....

....

(b)- Are you utilising the training undertaken by you in your class room teaching ? (tick the relevant)

Yes / No

4/- If yes how ? Give in brief some specific examples in 4 to 5 lines.

....

....

....

....

5/- If No , List the reasons for not utilising the training:

(a)- ....

(b)- ....

(c)- ....

6/- Have you undergone any training programme under the scheme of improvement of Science Education in schools(SISES) programme ?

Yes / No

7/- If yes, give details :-

(a)- Title of the programme

....

(b)- Place attended

....

(c)- Duration

....

(d)- Type : Primary/Elementary/Secondary/Higher Secondary

....

8/- If no , list the reasons for not attending the programme.

....

9/- Do you have any kit for teaching Science ?

Yes / No

(a)-if yes, does it help you in teaching Science in a better way ?

....

....

10/- Have you developed any improvised experiment ?(tick the relevant)

Yes / No

11/- If yes, list below the experiments you have designed .

(a)- ....

(b)- ....

(c)- ....

(d)- ....

12/- Have you obtained any financial support to develop the improvised experiments ?

Yes / No

13/- If yes , give the name of the organisation/person giving you the support .

....

Subject Teaching Profile

1/- Write below your area of specification at graduation level.

....

2/- For teaching topics other than your specialised area, what is the strategy you adopt ? Please put tick mark (√)

(a)- Reading text books from that area ☐

(b)- Using related reference material ☐

(c)- Watching/listening educational Television/Radio broadcasts ☐

(d)- Reading educational agazine / news papers ☐

(e)- Discussion with colleagues ☐

(f)- Any other

....

3/- Below are given some common difficulties experienced by teachers while teaching Science : (tick the relevant)

(a)- Presentation /Communication of concepts ☐

(b)- Sequence of concepts ☐

(c)- Lack of proper background to learn concepts ☐

(d)- Lack of understanding of the logic of concepts ☐

(e)- Lack of audio-visual aids to supplement / complement Science teaching. ☐

(f)- Lack of teacher demonstration to motivate students to learn Science. ☐

Write the difficult topics you realise while teaching Science in the given table

A- Theory Subject/Topic	Type of difficulties

4/- Does your school have a laboratory for conducting practicals of this stage ?

Yes / No

(a)- If yes , is it well equipped ? Yes / No

(b)-If it is not well equipped , what are the deficiencies.

....

....

5/- What difficulties does a student face in doing practical/laboratory work ? Tick the relevant

(a)-Lack of laboratory. ☐

(b)-Lack of facilities in laboratory. ☐

(c)-Lack of teacher supervision and guidance in the laboratory ☐

(d)-Lack of supporting staff in the laboratory. ☐

(e)-Hesitation of students in doing the practical work. ☐

(f)-Fear of accidents/mishaps in the laboratory. ☐

(g)-Any other.......................................

6/- Does the Principal/Educational Administrator facilitate the practical/laboratory work in the school at this stage ? (tick the relevant)

7/- Are out of school Science activities being conducted in your school ? (tick the relevant)

(A)- If yes, tick which of the out of school activities are conducted in your school at this stage ?

a) Display Science bulletin board. ☐

b) Organising Science lectures. ☐

c) Organising Science debates/Quiz ☐

d) Screening of Science telecasts/broadcasts ☐

e) Organising Science fairs ☐

f) Visits to places of scientific interests(Museum /Zoo /Botanical garden/Factories/Laboratories) ☐

g) Provision of Science Magazines/ Books/Newspapers ☐

(B) If No , what are the difficulties being faced by the school in conducting the activities listed 7 (A)

....

....

8/- Do you motivate the students in doing out of school Science activities ?(tick the relevant)

(a)- If yes, how do you motivate the students in doing out of school Science activities

....

....

(b)- If no , which of the activities listed in 7(a) do you feel difficult. . . to initiate with the reasons thereof:

S.No.	Activities Difficult to initiate	Reasons
1/-		
2/-		
3/-		
4/-		

9/- Do your tribal students actively participate in the class when you teach ?(tick the relevant)

(a)- If yes , how do the students actively participate in the Science class and indicate the strategies you use to promote tribal students participation ?

....

....

....

....

(b)- If no, what special difficulties do tribal students have in actively participating in the Science class ?

....

....

....

....

10/- What difficulties do you face while teaching the Tribal students ? (tick the relevant):

(a)- Language of communication ☐

(b)- Unsuitable curriculum material ☐

(c)- Lack of laboratory. ☐

(d)- Lack of Audio-visual aids ☐

(e)- Being first generation learners ☐

(f)- Poverty of students to purchase the necessary learning material ☐

Students Questionnaire

1/- District...

2/- Block...

3/- Name of the school..

4/- Location of the school Urban./Semi Urban/Rural

5/- Management of the school Govt./Semi Govt./Private

6/- Name of the student ....
Roll No ....

7/- Class in which you are studying............Section ....

8/- Tick the reasons which you feel are responsible for not understanding certain Science concepts in theory

(a)-Language of the teacher ☐

(b)-Difficult curriculum material. ☐

(c)-Sequence of concepts. ☐

(d)-Lack of minimum knowledge to understand the concepts ☐

(e)-Not presenting a concept in simple and understandable manner ☐

(f)-Lack of audio-visual aids to understand a Science concept. ☐

(g)-Lack of teacher demonstration to motivate to learn a concept. ☐

9/- Topics which you find difficult in studying Science

Topics	Reasons	Expectations from your teachers to remove your difficulties

10/- Is practical/laboratory work regularly being organised in your school ?(tick the relevant)

Yes / No

(A)- If yes , do you feel motivated ,excited and interested in doing practical/laboratory work ?(Tick the reason why you feel so)

(a)-It helps in understanding Science in a better way. ☐

(b)-It helps in creating interest in Science. ☐

(c)-It gives an opportunity to practically verify what has been taught in theory. ☐

(d)-It excites your mind to understand the potentialities and powers of Science. ☐

(e)-It helps to develop scientific reasons of how and why. ☐

(f)-It inculcates in us scientific values and attitudes like logic,sequence. ☐

(g)-It motivates us to protect and preserve environment around us and make judicious use

of natural resources. ☐

(B)-If no , what are the reasons of not doing practical/laboratory work (tick the relevant)

(a)-Lack of laboratory ☐

(b)-Lack of facilities in the laboratory ☐

(c)-Lack of teacher supervision and guidance in the laboratory. ☐

(d)-Lack of supporting staff in the laboratory. ☐

(e)-Hesitation of students in doing practical work ☐

(f)-Fear of accidents/mishaps in the laboratory ☐

(g)-Any other...

11/- Are out of school Science activities (list given below) being conducted in your school ? Tick which are the ones being conducted.

a-Display Science bulletin board. ☐

b-Organising Science lectures. ☐

c-Organising Science (debates/Quiz) ☐

d-Screening of Science(telecasts/broadcasts) ☐

e-Organising Science fair ☐

f-Visits to places of scientific interests (Museum /Zoo/Botanical garden/Factories/Laboratories) ☐

g- Reading Science magazine/books/newspapers ☐

12/- Tick the reasons for not conducting the out of school Science activities in your school.

(a)-Lack of materials ☐

(b)-Lack of interests of the teacher in these activities. ☐

(c)-Lack of interest of students. ☐

(d)-Lack of time in School calendar. ☐

(e)-Lack of support from parents etc. ☐

Instiutional Questionnaire

1/- District..

2/- Block..

3/- Name of the School

....

4/- Year of establishment
....

5/- Name of the Principal
....

6/- Educational qualification: ....

7/- Total experience of the Principal in School education
....

8/- Total experience in a tribal School....................

9/- Number of teachers in the School ....

10/- Break-up of teachers categorywise(numberwise)
P.G.T.......................T.G.T..................P.R.T.........

11/- Number of Science teachers.................................

12/- Categories of Science teachers(numberwise)
P.G.T.......................T.G.T.................
P.R.T..............

13/- Number of Science teachers teaching at Secondary stage............

14/- Educational qualifications ,teaching experience , participation in service programmes of the teachers teaching at secondary stage

S.No.	Name	Educational Qualification	Teaching experience	No.of workshops/ seminars attended in Science education
1/-				
2/-				
3/-				

15/- Total budget of the school (in Rs)........................

16/- Budget for Science laboratories in School (in Rs.)
....

17/- Does your school have enough chemicals . glass wares and apparatus for teaching science at secondary stage ? (tick the relevant one)

Yes/No

18/- Does your school have a laboratory or any other personal assistant in the Science laboratory ? (tick the relevant)

Yes/No

a/- If yes , his educational qualification /experience.

....

....

Educational Technology Questionnaire

1/- District...

2/- Block..

3/- Name of the school
....

4/- Year of establishment...........................

5/- Does your school have a Television ? (tick the relevant)
Yes/No

a/- If yes , do you watch the Science education programmes telecast by various channels? (tick the relevant)
Yes/No

b/- If yes , name the programme you watch
....

....

6/- Does your school have a Radio ? (tick the relevant) Yes/No

a/-If yes , do you listen to Science education programmes on the radio ? (tick the relevant) Yes/No

b/-If yes , name the Science programmes you listen to

....

....

7/- Does your school have enough of Science charts to depict various flora, fauna , industrial processes , life histories of scientists , anatomical representation of human body, balanced diet , alternate source of energy , conservation and protection of natural resources etc. ? (tick the relevant) Yes/No

a/-If yes, name the various categories of charts............

....

8/- Does your school have some model depicting structure of atoms , molecular structures of different chemicals , industrial processes etc ? (tick the relevant) Yes/No

a/- If yes , list them out category wise

....

....

....

9/- Does your School provide bulletin board for depicting Science news and scientific inventions etc ?(tick the relevant)

Yes/No

a/-If yes , mention the place where it is provided in the school building and the things depicted on the board...................................

Curriculum Material Questionnaire

1/- District...................................

2/- Block...................................

3/- Name of the school..............................

4/- Year of establishment............................

5/- Name the Science textbooks at Secondary Stage being used in the school..

....

6/- Name the publisher of the textbooks..........................

7/- Language of the textbooks......................................

8/- Is the language of the textbooks within the comprehension of the (tick the relevant)

a/- Teachers Yes/No

b/- Students Yes/No

9/- If no , what difficulties do you find in the language of the text books ?Tick the relevant

(a)-Difficult vocabulary ☐

(b)-Language which is not understood by theTribal students ☐

(c)-The flow of the language is uneven. ☐

10/- Do the textbooks have sufficient diagrams and charts to make Science concepts easy ? (tick the relevant) Yes/No

a/-If yes , pinpoint the defects in the diagrams and the charts...
....

11/- Are you provided with a teacher's guide to supplement and complement your knowledge in Science so that you are a very effective Science teacher in teaching Science ?(tick the relevant) Yes/No

a/-If yes , what additional information is provided in the teacher's guide to make you very effective Science teacher

....

....

12/- Are you provided with supplementary reading material about Science to make science teaching enjoyable and interesting to learn ? (tick the relevant)

Yes/No

A/-If yes , name the topics which are covered in the supplementary reading material...................................

....

B/-If yes , are the recently emerged topics also covered in the supplementary materials ? (please list such topics)

....

....

APPENDIX – C

REGIONAL INSTITUTE OF EDUCATION , BHOPAL

Title of the Programme

" Identification of training needs of Secondary Science
Teachers of Tribal Schools of Madhya Pradesh "

VENUE
REGIONAL INSTITUTE OF EDUCATION
BHOPAL
Dates
22ND Nov.'99 to 26th Nov.'99

WORK –SCHEDULE

22-11-1999

Forenoon

Registration of Participants .
Inaugration of the Workshop.

Lunch Break

Afternoon

Review of the work done previously

23-11-1999

Forenoon

Review of the tentative tools and chalking out of the strategy for the further work and preparation of material on dimensions of training needs.

Lunch Break.

Afternoon

Development of tools on teacher questionnaire

24-11-1999

Forenoon -Development of tools on student questionnaire.

Lunch Break

Afternoon -Development of tools on Educational technology Questionnaire and Curriculum material Questionnaire.

25-11-1999

Forenoon -Development of tools on Institutional Questionnaire.Discussion content analysis already Done.

Lunch Break

Afternoon -Development of tools on Societal support and Refinement of the tools.

26-11-1999

Forenoon -Editing of the tools.

Lunch Break

Afternoon -Valedictory and Disbursement of T.A. /D.A.

APPENDIX - D

LIST OF RESOURCE GROUP

REGIONAL INSTITUTE OF EDUCATION

1/-Shri.A.C.Pachauri

2/-Dr(Miss).S.P.Patnaik.

3/-Dr. S.P.Sharma

4/-Dr. V. Kakaria.

5/-Shri. J.N.Verma

6/-Dr. P.N.Pathak , Programme Co-ordinator

Resource Persons of **DEME** , **NIE** , **NCERT** , New Delhi who participated in the workshop.

1/-Dr. B.L.Pandit

2/-Dr. A.D.Tiwari.

APPENDIX-E

List of Tribal schools from where the data were collected

District	Name of Blocks	Names of the Schools
Mandla	**Narayanganj**	1.G.H.S.S. Narayanganj 2.G.G.H.S. Narayanganj 3.Naveen High School Bamhni 4.G.H.S.S. Babalia (Khinha)
	Bija Dandi	1.G.H.S.S. Kalpi 2.G.G.H.S.S. Bijadandi 3.G.H.S.S. Bijadandi 4.G.H.S.S. Maneri
	Nivas	1.G.H.S. Hathi Tara 2.G.H.S. Vangalis 3.G.H.S.S. Amagawan
	Mandla	1.G.H.S.S. Limurua 2.G.H.S.S. Sagar
	Mohgaon	1.G.H.S. Mohgaon 2.G.H.S. Singarpur 3.G.H.S. Deogoan
	Nainpur	1.G.H.S.S.Chirai Dongri 2.G.G.H.S.S. Indri 3.Govt Naveen High School, Gamgaon
	Bicchia	1.G.H.S.S. Sishora 2.G.H.S.S. Ahamadpur
	Ghughri	1.G.H.S.S. Ghughri

District	Name of the Blocks	Name of the Schools
Dindori	**Dindori**	1.G.H.S.S. Dindori
	Amarpur	1.G.H.S. Kisalpuri
	Samnapur	1.G.G.H.S.S. Samnapur 2.G.H.S.S. Samnapur
	Mehandwani	1.G.H.S.S. Rai
Shehdol	**Pusprajgarh**	1.G.H.S.S. Amarkantak
Chhindwara	**Chhindwara**	1.Govt.KanyaShiksha Parisar Chhindwara
	Junnardeo	1.G.H.S.S. Nandan 2.G.H.S.S. Damua 3.G.G.H.S.S.Damua 4.G.H.S.S. Dungaria 5.G.H.S.S. Palachaurai
	Tamia	1.G.G.H.S. Tamia 2.G.H.S.S. Tamia 3.G.H.S.S. Chhindi 4.G.H.S.S. Jhirpa
Chhindwara -	**Parasia**	1.G.G.H.S.S. Pagara
	Bicchua	1.G.H.S.S. Bicchua 2.G.G.H.S.S. Bicchua 3.G.H.S.S. Khamar pani 4.G.H.S.S. Khamra 5.Naveen High School Samarboh 6.G.H.S. Ulhabadi

District	Name of the Blocks	Name of the Schools
Hoshangabad	**Kesla**	G.H.S.S. Jamani
Kanker	**Bhanupratappur**	G.H.S.S. Bhanupratappur

Abbreviations used for

G.G.H.S.S.:	Government Girls Higher Secondary School.
G.H.S.S. :	Government Higher Secondary School
G.G.H.S. :	Government Girls High School
G.H.S. :	Government High School.